

Pulmonary Tuberculosis with Genitourinary Involvement Presented as a “Putty Kidney”

Tuberculosis pulmonar con compromiso genitourinario: presentación como “riñón en masilla”

Wilber Balcera Estrada¹ , Xavier Alejandro Paredes Morales¹ , Moises Octavio Molina Castro¹ , Christian Fabricio Sancan Zambrano¹ , Tobías Bailón¹ , Alejandra Gonzalez¹ , Marcela Heres¹ , Carlos Tummino¹ 

¹ Pulmonology Service, Hospital Nacional Profesor Alejandro Posadas, Buenos Aires, Argentina.

Received: 04/14/2026

Accepted: 06/04/2026

Correspondence

Wilber Balcera Estrada
wilberbalcera@gmail.com

ABSTRACT

Genitourinary tuberculosis is an extrapulmonary manifestation that is often underdiagnosed due to nonspecific urinary symptoms. Renal involvement may progress to advanced destructive disease with diffuse calcification (“putty kidney”), leading to severe urologic sequelae, chronic kidney disease, and even nephrectomy. We report a 28-year-old man with microbiologically confirmed pulmonary tuberculosis (positive smear microscopy, molecular testing, and respiratory culture) who developed worsening urinary symptoms (dysuria, hematuria, urinary frequency, and flank pain) and fever during hospitalization. Urinalysis revealed sterile pyuria, proteinuria, and acidic urine; urine mycobacterial smear and culture were positive. Ultrasound and non-contrast abdominal CT demonstrated advanced right renal involvement with calcifications and urinary tract stenosis, consistent with advanced genitourinary tuberculosis. A multidisciplinary approach was implemented, including double-J ureteral stent placement and continuation of standard anti-tuberculosis therapy. Renal function remained stable throughout hospitalization and follow-up. This case highlights the need to consider genitourinary tuberculosis in patients with persistent urinary symptoms and sterile pyuria, particularly in the setting of active tuberculosis, to prevent irreversible renal damage.

Key words: extrapulmonary tuberculosis genitourinary tuberculosis sterile pyuria
putty kidney renal tuberculosis

RESUMEN

La tuberculosis genitourinaria es una forma extrapulmonar frecuentemente subdiagnosticada debido a su presentación inespecífica. El compromiso renal puede progresar a estadios avanzados con destrucción parenquimatosa y calcificación difusa («riñón en masilla» o putty kidney), asociadas a secuelas urológicas graves, insuficiencia renal crónica e incluso nefrectomía. Presentamos el caso de un varón de 28 años con tuberculosis pulmonar confirmada mediante baciloscopia, prueba molecular y cultivo respiratorio positivos, que durante su internación presentó reagudización de síntomas urinarios (disuria, hematuria, polaquiuria y dolor lumbar) y fiebre. El examen de orina evidenció piuria estéril, proteinuria y pH ácido; la baciloscopia y el cultivo para micobacterias en orina fueron positivos. La ecografía y la tomografía computarizada abdominopélvica sin contraste evidenciaron compromiso renal derecho con calcificaciones y estenosis de la vía urinaria, compatibles con tuberculosis genitourinaria avanzada. (Figura 1) Se realizó un abordaje interdisciplinario con colocación de catéter doble J y continuidad del esquema antituberculoso. La función renal se mantuvo estable durante la internación y el seguimiento. Este caso resalta la importancia de sospechar tuberculosis genitourinaria ante piuria estéril y síntomas urinarios persistentes, especialmente en pacientes con tuberculosis activa, para evitar daño renal irreversible.

Palabras clave: tuberculosis extrapulmonar tuberculosis genitourinaria piuria estéril
riñón en masilla putty kidney

INTRODUCTION

Tuberculosis (TB) remains a major public health concern in Argentina.¹ In recent years, a steady increase in the number of reported cases has been observed, underscoring its persistence as a significant public health challenge. Although pulmonary TB accounts for most cases, extrapulmonary manifestations continue to represent a substantial proportion of the disease burden and are often associated with greater diagnostic challenges. Genitourinary tuberculosis (GUTB) is frequently underdiagnosed due to its insidious course and nonspecific presentation, both of which can delay diagnosis and lead to irreversible sequelae.²⁻⁴

Hematogenous dissemination can involve the genitourinary tract, resulting in GUTB.^{2,3} Renal involvement can progress to ureteral strictures, obstruction, functional sequelae, and renal impairment.^{4,5} In advanced stages, diffuse calcification with parenchymal destruction and loss of function may be observed, a condition known as “putty kidney”. Although less common today due to early diagnosis and treatment, it remains a possible manifestation in patients with delayed diagnosis.^{2,5}

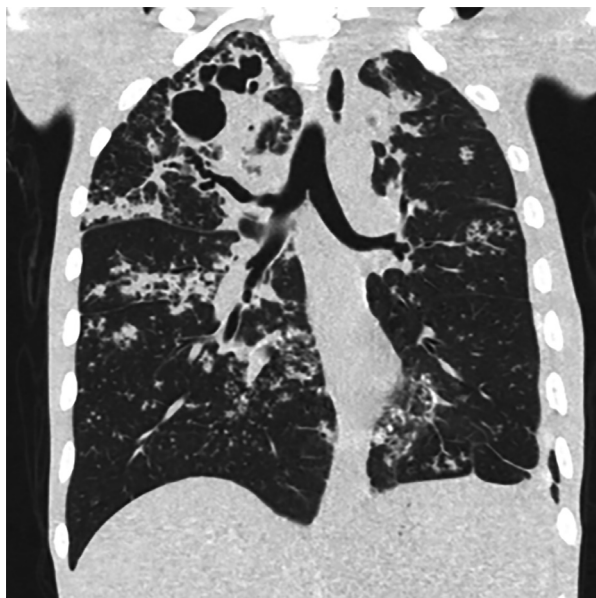
CASE REPORT

A 28-year-old man with no known comorbidities presented with chronic cough and weight loss. He also reported intermittent urinary symptoms and prolonged fever.

Chest computed tomography (CT) revealed predominantly apical cavitation alongside alveolar infiltrates displaying a ‘tree-in-bud’ pattern. Sputum acid-fast bacilli smear microscopy and molecular testing (GeneXpert) were positive, showing no rifampicin resistance; cultures of respiratory specimens were also positive. First-line anti-tuberculosis therapy was initiated. Serologic testing for HIV, hepatitis B virus, and hepatitis C virus was negative.

During hospitalization, the patient’s urinary symptoms worsened, with dysuria, hematuria, urinary frequency, and flank pain, although no recurrent fever was documented. Urine sediment examination showed pyuria with negative routine bacterial cultures (compatible with sterile pyuria), proteinuria (+++), and acidic urine (pH, 6.0). Further evaluation revealed positive urine acid-fast bacilli smear microscopy and mycobacterial culture.

Figure 1. Tchest CT (coronal reconstruction, lung window). Predominantly apical cavitation and nodular/branching opacities compatible with endobronchial dissemination (a 'tree-in-bud' pattern), in the context of active pulmonary tuberculosis.



Renal ultrasound demonstrated an enlarged right kidney with echogenic material within the collecting system and renal calcifications. Non-contrast abdominopelvic CT demonstrated right renal involvement with calcifications and urinary tract stricture (Figure 2), consistent with advanced genitourinary tuberculosis. No evidence of urinary tract obstruction was identified. Renal function was preserved at the time of diagnosis and remained stable throughout hospitalization.

The patient underwent multidisciplinary management involving the Urology Service, and a double-J ureteral stent was placed for urinary drainage. The patient's clinical status improved, allowing for hospital discharge and transition to outpatient surveillance for monitoring and treatment follow-up.

DISCUSSION

Genitourinary tuberculosis (GUTB) is an extrapulmonary manifestation of tuberculosis that remains underdiagnosed because of its nonspecific presentation and typically insidious course. In Argentina, 14,914 cases of tuberculosis were reported in 2023, representing a rate of 32 cases per

Figure 2. Contrast-enhanced abdominopelvic CT (coronal reconstruction). Right kidney showing advanced structural involvement of the pyelocaliceal system and calcifications, with findings compatible with advanced genitourinary tuberculosis associated with urinary tract strictures.



100,000 inhabitants).¹ Globally, the World Health Organization estimates that approximately 84% of notified cases correspond to pulmonary tuberculosis, and 16% to extrapulmonary forms.² In this context, the coexistence of laboratory-confirmed pulmonary tuberculosis and persistent or worsening urinary symptoms should raise suspicion for genitourinary involvement, particularly when associated with sterile pyuria.^{3,4}

Clinically, GUTB typically presents with dysuria, increased urinary frequency, urinary urgency, and hematuria, alongside flank or suprapubic pain.^{3,4} A classic laboratory finding is sterile pyuria, occasionally accompanied by microscopic hematuria, proteinuria, and acidic urine; in compatible clinical scenarios, this profile necessitates targeted mycobacterial testing, including urine acid-fast bacilli (AFB) smears, cultures, and/or molecular assays.^{3,4} In the present case, positive urine AFB smear and mycobacterial culture confirmed the diagnosis, explaining the discrepancy with the routine negative bacterial culture.

Diagnosis and assessment of disease severity generally require integration of microbiologic and imaging findings. The ultrasound may demonstrate renal enlargement, echogenic material within the collecting system, and calcifications, whereas CT more accurately characterizes the

extent of the disease (parenchymal involvement, calcifications, ureteral or urinary tract strictures) and guides urologic management.⁵⁻⁷

Among the advanced sequelae, the putty kidney represents late-stage disease characterized by diffuse calcification and parenchymal destruction, potentially associated with functional impairment, and urologic complications.^{6,8} However, renal function may remain preserved in early-stage disease or in patients with unilateral involvement, as observed in this case. Preservation of renal function should not delay diagnosis or treatment, given the risk of progression to ureteral strictures, obstruction, and functional loss.^{3,4}

Treatment consists of standard anti-tuberculosis regimen, whereas urologic intervention depends on the extent of anatomic and functional involvement. In selected patients, placement of a double-J ureteral stent or percutaneous nephrostomy may be required to relieve urinary

obstruction, ensure adequate drainage, alleviate symptoms, and preserve renal function.^{3,4} In the present case, multidisciplinary management, including placement of a double-J ureteral stent and continuation of anti-tuberculosis therapy, was associated with clinical improvement and stable renal function throughout hospitalization and follow-up.

To conclude, in the presence of sterile pyuria and persistent or worsening urinary symptoms –particularly in patients with active tuberculosis–genitourinary tuberculosis (GUTB) must be considered, warranting targeted urine mycobacterial testing and urinary tract imaging to prevent irreversible sequelae.³⁻⁶

Conflict of interest

Authors have no conflicts of interest to declare.

Funding

No specific funding was received for this study.

REFERENCES

1. Ministerio de Salud de la Nación (Argentina). Dirección de Respuesta al VIH, ITS, Hepatitis Virales y Tuberculosis. Coordinación de Tuberculosis y Lepra. Boletín N° 7: Tuberculosis y lepra en la Argentina. Año VII. Marzo de 2024. Buenos Aires: Ministerio de Salud; 2024. Disponible en: https://www.argentina.gob.ar/sites/default/files/2024/04/boletin_tuberculosis_2024_1642024.pdf. Acceso: 19 feb. 2026.
2. World Health Organization. Global tuberculosis report 2024. Geneva: WHO; 2024. Disponible en: <https://www.who.int/teams/global-programme-on-tuberculosis-and-lung-health/tb-reports/global-tuberculosis-report-2024>. Acceso: 19 feb. 2026.
3. Roddy K, Tobin EH, Leslie SW, Rathish B. Genitourinary Tuberculosis. En: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing. Disponible en: <https://www.ncbi.nlm.nih.gov/books/NBK557558/>. Acceso: 19 feb. 2026.
4. Mantica G, Ambrosini F, Riccardi N, et al. Genitourinary Tuberculosis: A Comprehensive Review of a Neglected Manifestation in Low-Endemic Countries. *Antibiotics (Basel)*. 2021;10:1399. <https://doi.org/10.3390/antibiotics10111399>.
5. Jung YY, Kim JK, Cho KS. Genitourinary tuberculosis: comprehensive cross-sectional imaging. *AJR Am J Roentgenol*. 2005;184:143-50. <https://doi.org/10.2214/AJR.184.1.01840143>.
6. Naeem M, Zulfiqar M, Azfar M, et al. Imaging Manifestations of Genitourinary Tuberculosis. *Radiographics*. 2021;41:1123-43. <https://doi.org/10.1148/rg.2021200154>.
7. Ladumor H, Al-Mohannadi S, Ameerudeen FS, Ladumor S, Fadl S. TB or not TB: A Comprehensive Review of Imaging Manifestations of Abdominal Tuberculosis and Its Mimics. *Clin Imaging*. 2021;76:130-43. <https://doi.org/10.1016/j.clinimag.2021.02.012>.
8. Deftereos S, Foutzitz S. The putty kidney: a classic sign from the past in genitourinary radiology. *Pan Afr Med J*. 2022;42:16. <https://doi.org/10.11604/pamj.2022.42.16.34128>.